Science and scientists from the children point of view, an overlook from drawings

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I'm a scientist too! INGV calendar

The Istituto Nazionale di Geofisica e Vulcanologia (INGV) is currently the largest European scientific institution dealing with Earth Sciences research and real-time surveillance, early warning, and forecast activities in geophysics and volcanology.
The Laboratorio Didattica e Divulgazione Scientifica of INGV organizes every year educational and outreach activities with schools of different levels and with general public to convey scientific knowledge and to promote the Research on Earth Science, focusing on volcanic and seismic hazard.

Among the most successful initiatives is the creation of a calendar designed for the schools and realized based on a competition devoted to children of primary school.
The intent is to provide a pleasant stimulus for discussion for teachers and students. Schools participate with enthusiasm by sending drawings made by children on a specified theme, different each year, chosen among geophysics and earth sciences arguments of Geophysics. For 2011, the theme of the calendar was selected also with the aims to investigate on the image the young generations have of the Research and on its potential and future prospective. The title was "Scienziato anche io! La Scienza e gli scienziati visti dai bambini" (I'm a scientist too! Science and scientists from the children point of view), with the purpose of giving a shape to the image children have of the world of science, its potential and the figure of the scientists.

1. ***How do you imagine a scientist? How do you imagine the daily activities of a researcher?***
2. ***What is the invention you consider the most important among all those you know?***
3. ***What would you invent?***

The 986 drawings were realized by 6 up to 10 years old boys and girls from 48 schools distributed throughout the Italian territory.

Preliminary analysis: the Draw A Scientist approach

The drawings have been classified into three groups: 1) group "scientist": the drawings represent scientists experimenting, thinking, or simply doing nothing, scientists alone or with their inventions; 2) group "invention": drawings represent inventions alone; 3) group "other".

The approach follows and extends Ruiz-Mallen and Escalas 2012, after Fralick et al. 2009. The classification scheme includes indicators about: the author of the drawing (age, gender, living area); the portrayed scientists: scientist's wear (e.g. dressing a white coat, wear glasses, and having crazy hair); domain of scientific knowledge (biochemistry or chemistry, astronomy or astrophysics, mathematics, environmental sciences, botany or zoology, medicine, robotic technology or informatics engineering, arts and humanity); research tools (presence of written formulas, laboratory tools and technological tools); location (indoor in a laboratory, ...or outdoor); scientist's personality (serious or angry, solitary, ...); scientist's type of work (experimenting: actively testing, discovering; thinking, looking up, light bulb, question mark about the scientist's head; teaching, writing in classroom, explaining to non scientist people, ... or doing nothing; scientist attitude (scientist depicted as violent, malefic, or unpleasant); perceived risk factors in doing science (danger, unsafety); the drawing technique (e.g. presence of speech bubbles, captions and descriptions).

A first sample of 200 drawings have been analyzed in order to test and refine the classification scheme.

Scientists and inventions

Browsing the drawings depicting scientists we found: scientists wearing glasses, white coats and disheveled; a few crazy scientists (25% drawn by boys, 5% drawn by girls); women scientists portrayed as good-looking and well-dressed women [Rodari, 2007; Di Benedetto et al., 2009], mostly drawn by girls; scientists together with their inventions; scientists who are first of all technologists, designing robots and machines, chemists, astronomers, biologists, physicians, volcanologists, naturalists.

Drawn inventions include robots, which help in housekeeping, doing homeworks,...; rockets and space vehicles; time machines; fictional machines, e.g. the machine which shots ice-creams instead of bullets; inventions which realize dreams or fulfills special requirements and satisfy personal tastes; inventions for the environment or green inventions (e.g. the green lift,...); inventions that help in human caring.
The group "other" includes those drawings in which the content was too difficult to understand or in which a discipline is represented in a more general sense; for example a drawing depicting a solar system, for astronomy, or a natural history museum.

Pencils, permanent markers, pastels are mostly used. A few drawings are painted with tempera and show some special effects (i.e. collages, gold powder, ...) Many drawings use the comic strips technique. Speech bubbles are used to give descriptions of the inventions.

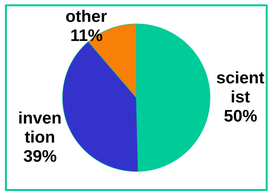
Pupils belonging to a same class may copy from one another and/or may follow the suggestions of the teachers. In this sense, we find repeated subjects and drawings within the same class.

Further developments and open questions

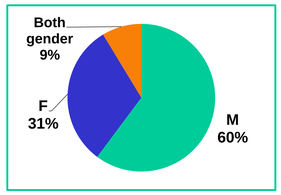
Are there some features to take into account and find a correlation with age, gender and/or living area of the drawer?
Do boys and girls image a scientist in the same way?
Is there a stereotypical image of science and scientists? Or something is changing?
Is there a gap between children's perceptions and scientists' reality?
The drawings report us a generally positive picture of the work of scientists and also highlight a great level of confidence in the potential of science, capable to respond to needs and problems of the humanity and of the environment in which we live.
Moreover, the drawings provide us a direct and unconventional approach to point out how we convey the scientific research - a strategic topic for a suitable future of the humanity - to the players of the world of tomorrow.

I am as scientist too! INGV calendar

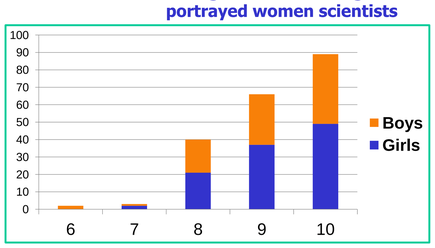
Localization of the 30 schools which participated to the competition



Drawings % depicting scientists and inventions



Drawings % depicting scientists: male, female and of both genders. 95% of girls portrayed women scientists

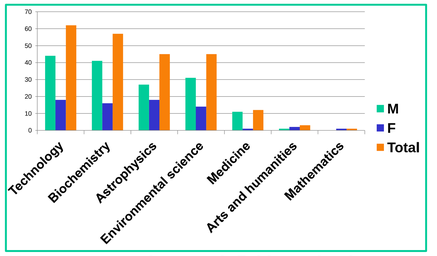


First sample of 200 drawings. Authors are children more than 8 years old, 55% are girls

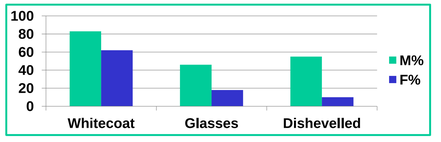
A young and good-looking scientist. She invented a machine that "makes you happy"!

A woman scientist drawn with crazy hair and glasses to respect the stereotype

A naturalist studying flowers

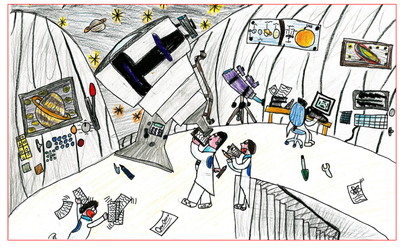


Most represented research fields: technology, biochemistry, astrophysics and environmental sciences



White coats, glasses and crazy hair are stereotypical features mostly for male scientists

Scientists are often (70%) depicted with other scientists or assistants



Experiments are dangerous, but only in 10% of drawings

Two young scientists with multidisciplinary activities: they invent a low-cost lamp and study dinosaurs

The tube for tele-transportation, useful for ageing people. Drawn by G., female, 10 years old from Trieste

The cloud that shots ice creams. Drawn by D., male, 7 years old from Torino

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